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Sir:

In re: U.S. Serial No. 09/454,124
Inventor: Jorma Antero Seppanen
Title: **SIGNAL QUALITY INDICATOR APPARATUS AND METHOD PARTICULARLY USEFUL FOR MOBILE TELEPHONES**

Enclosed please find:

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Respectfully submitted,

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the Application of:	Jorma Antero Seppanen
For :	SIGNAL QUALITY INDICATOR APPARATUS AND METHOD PARTICULARLY USEFUL FOR MOBILE TELEPHONES
U.S. Serial No.:	09/454,124
Filed:	December 3, 1999
Group Art Unit:	2684
Examiner:	Sharma, Sujatha R.
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Diane Taylor
Diane Taylor

APPEAL BRIEF

This Appeal Brief is submitted in triplicate on behalf of Appellant for the application above. The Commissioner is hereby authorized to charge the $330.00 fee for filing this appeal brief, pursuant to 37 C.F.R. §1.17(c), to Deposit Account No. 50-2032.

REAL PARTY IN INTEREST

The real party in interest for this appeal is the assignee of the application, Nokia Mobile Phones Limited.

RELATED APPEALS AND INTERFERENCES

There are no currently-pending appeals or interferences relating to the present application.

STATUS OF THE CLAIMS

Claims 1, 3-13 and 15 are pending in the application. All claims stand rejected. Claims 1, 3, 13 and 15 were rejected under 35 U.S.C. 103(a) as being unpatentable over *Coverdale*, U.S. Patent No. 5,809,414 (hereafter, *Coverdale*) in view of *Shah*, U.S. Patent No. 6,167,259 (hereafter *Shah*). Claims 4-7 and 10-12 were rejected under 35 U.S.C. 103(a) as being unpatentable over *Coverdale*, U.S. Patent No. 5,809,414 in view of *Shah*, U.S. Patent No. 6,167,259 and further in view of *Detlef*, U.S. Patent No. 6,243,568 (hereafter, *Detlef*). Claim 5 was rejected under 35 U.S.C. 103(a) as being unpatentable over *Coverdale*, U.S. Patent No. 5,809,414 in view of *Shah*, U.S. Patent No. 6,167,259 and further in view of Champness G.B. Patent No. 2,275,848 (hereafter Champness). Claim 8 was rejected under 35 U.S.C. 103(a) as being unpatentable over *Coverdale*, U.S. Patent No. 5,809,414 and *Shah*, U.S. Patent No. 6,167,259 in view of *Detlef*, U.S. Patent No. 6,243,568 as applied to claim 6 above and further in view of *Besharat*, U.S. Patent No. 6,219,540 (hereafter, *Besharat*). Claim 9 was rejected under 35 U.S.C. 103(a) as being unpatentable over *Coverdale*, U.S. Patent No. 5,809,414 and *Shah* U.S. Patent No. 6,167,259 in view of *Detlef*, U.S. Patent No. 6,243,568 and further in view of *Besharat*, U.S. Patent No. 6,219,540 as applied to claim 8 above and further in view of *Obayashi*, U.S. Patent No. 5,802,039 (hereafter, *Obayashi*). Appeal is made to the rejection of all the claims (1, 3-15 and 15).

STATUS OF AMENDMENTS

No amendments to the claims were filed following the final Office Action dated January 9, 2004 responsive to which this Appeal Brief is submitted.

SUMMARY OF THE INVENTION

The present invention relates to apparatus and methods for indicating the quality of received signals in a mobile phone. The quality of a received signal is detected. The results of this detection are presented to the user as by any one or more of a variety of indicators. For example, blinking signal strength displays could indicate the channel quality. An audible alert could be employed as could text on the display, a vibrating

indicator, an icon, indicator lights including variable intensity and/or variable color displays, and the like. Also audio signal quality could be used for the same purpose, namely an indication of the extent of distortion of the signal.

An embodiment of the process for operating with both digital and analog systems is shown in the flow chart of Fig. 4. Upon power up 45 of the apparatus, a determination 46 is made as to the phone operating mode. Thus, if an analog voice channel is determined to be present, branch 48A is enabled. The presence of an analog control channel signal enables branch 48B whereas digital voice and control channels are enabled through branches 48C and 48D, respectively.

Each branch proceeds with a quality measurement process 49. Thus, for the analog voice channel, a Supervisory Audio Tone (SAT) measurement 50A is made. For analog control, a Cyclic Redundancy Check (CRC) measurement 50B is performed while a digital Bit Error Rate (BER) acceptability for either of the two digital channels is determined in blocks 50C and 50D. In all four cases, a decision 52 is made as to whether the quality of the received signal is good or not good. A normal signal indicator 54 is enabled in the former situation whereas an inferior signal indicator 56 is enabled for the latter (page6, lines12-26).

A typical quality decision 50 within block 49 of Fig. 4 is shown in greater detail in Fig. 5. The signal is received at 47 as enabled by detector 48. It is compared against a predetermined level and either a good or a not-good output is produced. If the quality of the signal is below the predetermined level, a decision 65 is then made as to whether this signal condition has remained below the predetermined minimum level for a specified amount of time. If it has, then the decision is made that a "not good" signal quality condition exists and the output so indicates. If it fails to stay below the minimum, it is presumed that a "good" condition exists and that output is so indicated. The inverse decision process is provided by 66 (page 7, lines 7-16).

Fig. 6 is a block diagram of a signal quality indication system based upon an audio quality measurement while Fig. 7 is a more detailed diagram of the audio quality measurement element of FIG. 6. In this embodiment, a phone mode determination is initially provided to indicate either digital or analog control output signal 71 is to be

introduced to block 72 or a digital or analog voice signal at 73 is to be introduced to voice channel 74 (page 7, lines 17-22).

In the Fig. 6 system, the voice channel signal quality is measured at block 75 which is shown in greater detail in Fig. 7. As described previously herein, the decision results in either a good output 91 or a bad output 92. The former enables the normal signal quality indicator 76 while the latter enables the inferior signal indicator 77. The time-out function 78 is once again employed to ensure that the signal condition is maintained for more than a transient period of time (page 7, lines23-29).

In Fig. 7, the current audio status element 84 determines whether the audio distortion is above or below a predetermined level. If so, output 85A is introduced to element 86 which determines whether this condition has existed for at least a preselected period of time. In this case, a good output 91 is produced (page 8, lines 1-5).

Conversely, if this distortion has existed above the selected limit for a specified period of time, not good output 92 is raised indicating an unacceptable amount of distortion. Once again, failure of the distortion level to remain above the specified level of the selected period of time raises the presumption that the distortion was merely a transient (page 8, lines 6-10).

ISSUES ON APPEAL

1. Whether claims 1, 3, 13 and 15 were properly rejected under 35 U.S.C. 103(a) as being unpatentable over *Coverdale*, U.S. Patent No. 5,809,414 in view of *Shah*, U.S. Patent No. 6,167,259.

2. Whether claims 4-7 and 10-12 were properly rejected under 35 U.S.C. 103(a) as being unpatentable over *Coverdale*, U.S. Patent No. 5,809,414 in view of *Shah*, U.S. Patent No. 6,167,259 and further in view of *Detlef*, U.S. Patent No. 6,243,568.

3. Whether claim 5 was properly rejected under 35 U.S.C. 103(a) as being unpatentable over *Coverdale*, U.S. Patent No. 5,809,414 in view of *Shah*, U.S. Patent No. 6,167,259 and further in view of Champness G.B. Patent No. 2,275,848.

4. Whether claim 8 was properly rejected under 35 U.S.C. 103(a) as being unpatentable over *Coverdale*, U.S. Patent No. 5,809,414 and *Shah*, U.S. Patent No. 6,167,259 in view of *Detlef*, U.S. Patent No. 6,243,568 as applied to claim 6 above and further in view of *Besharat*, U.S. Patent No. 6,219,540.

5. Whether claim 9 was properly rejected under 35 U.S.C. 103(a) as being unpatentable over *Coverdale*, U.S. Patent No. 5,809,414 and *Shah*, U.S. Patent No. 6,167,259 in view of *Detlef*, U.S. Patent No. 6,243,568 and further in view of *Besharat*, U.S. Patent No. 6,219,540 as applied to claim 8 above and further in view of *Obayashi*, U.S. Patent No. 5,802,039.

GROUPING OF CLAIMS

For the purposes of this appeal, the pending claims will be grouped together as follows:

Group A - claims 1, 3, 13 and 15;

Group B - claims 4-7 and 10-12;

Group C - claim 5;

Group D - claim 8; and

Group E - claim 9.

Groups A- E stand or fall independently. Patentability of the claims within each group is argued separately below.

ARGUMENT

Group A

Claims 1, 3, 13 and 15 were rejected under 35 U.S.C. 103(a) as being unpatentable over *Coverdale*, U.S. Patent No. 5,809,414 in view of *Shah*, U.S. Patent No. 6,167,259.

Coverdale describes a system for deliberately introducing noise into a digital mobile voice communication link. The noise mimics the behavior of an analog mobile unit as it moves out of communication range and the signal degrades (col. 2, lines 6-11). As a result of the use of cordless phones and analog cell phones, users have become accustomed to the gradual degradation associated with analog signals as the handset moves out of range. The degraded communication is provided as an indication to the user that the communication link is about to fail.

Shah, on the other hand provides no indication to the user of a mobile unit regarding any degradation in signal quality. Instead, *Shah* discloses a system for balancing the forward and reverse links in order for both the calling party and the called party to perceive substantially equivalent voice quality (col. 3, lines 13-16). The measurement of signal quality is *Shah* is strictly for use by the communication system to transparently enhance the voice quality for its users.

The Examiner relies upon *Coverdale* for disclosing the providing of an output correlated to the results of an inspection of the received signal for determining quality. Review of *Coverdale*, however, indicates that this reference fails to provide a manner, or step, of providing an output as recited in the claim. Namely, *Coverdale* fails to disclose providing an output of different types, depending upon the comparison of a received signal with a predetermined threshold, as recited in the claims as they currently stand.

The Examiner acknowledged that *Coverdale* fails to disclose a signal quality indicated in terms of an acceptable percentage and relies upon *Shah* for disclosing a wireless communication system that evaluates a quality of service by analyzing the BER percentage. While *Shah* makes reference to a BER detection, the reference also fails to disclose a manner by which to provide an output of the different types to a user as recited. In fact, there is no intent in *Shah* to provide a

user with any indication of the signal quality. The BER detection is used by the system for balancing the forward and reverse signal.

Furthermore, Appellant respectfully asserts that it would not have been obvious to one of ordinary skill in the art at the time the invention was made to have modified *Coverdale* in view of *Shah*. The disclosed inventions in *Coverdale* and *Shah* are distinctly different from each other and are directed to opposing purposes. While Cloverdale's intent is to get the attention of a user by explicitly providing an overt indication to the user that the mobile unit is moving out of range for which the system has no correction, *Shah* discloses a system which, if functioning correctly, is transparent to the user. The system in *Shah* instead attempts to compensate for a degradation in the signal between the forward and reverse links without the user's knowledge.

Group B

Claims 4-7 and 10-12 were rejected under 35 U.S.C. 103(a) as being unpatentable over *Coverdale*, U.S. Patent No. 5,809,414 in view of *Shah*, U.S. Patent No. 6,167,259 and further in view of *Detlef*, U.S. Patent No. 6,243,568.

In the same field of endeavor as *Coverdale*, *Detlef* describes a system for deliberately introducing noise into a digital mobile voice communication. The noise mimics the behavior of an analog mobile unit as it moves out of and into communication range with the signal degrading and improving respectively.

Appellant respectfully asserts that *Coverdale* and *Shah* taken together do not disclose the subject invention for the reasons stated in Group A above. Moreover, Appellant asserts that *Detlef* adds nothing new. The Examiner states that *Detlef* teaches ensuring that the received signal has failed to meet the threshold value for a predetermined time-out period before generating the output indicative of such a failure (col.5, lines 64-67; col7, lines 21-38). Appellant asserts that this time period is not an intentionally designed time period but rather simply a clock cycle (col. 7, line 29) or decoder processing delay (Fig.4 label for time slot 34) which would necessarily be required of any electrical circuit.

The Examiner further states that *Detlef* teaches a method of separating the voice and control signals that are received in a time division multiplexed format citing (col.2,

lines 36-50; Figure2; col.3, lines 29-45; col.4, lines 36-57; Fig.3, element 58). Appellant can find no such teaching in *Detlef*.

Group C

Claim 5 was rejected under 35 U.S.C. 103(a) as being unpatentable over *Coverdale*, U.S. Patent No. 5,809,414 in view of *Shah*, U.S. Patent No. 6,167,259 and further in view of *Champness*, G.B. Patent No. 2 275 848.

Appellant respectfully asserts that *Coverdale* and *Shah* taken together do not disclose the subject invention for the reasons stated in Group A above and that *Champness* adds nothing new to the rejection of independent claim 1 from which claim 5 depends.

Group D

Claim 8 was rejected under 35 U.S.C. 103(a) as being unpatentable over *Coverdale*, U.S. Patent No. 5,809,414 and *Shah*, U.S. Patent No. 6,167,259 in view of *Detlef*, U.S. Patent No. 6,243,568 as applied to claim 6 above and further in view of *Besharat*, U.S. Patent No. 6,219,540.

Appellant respectfully asserts that *Coverdale* and *Shah* in view of *Detlef* do not disclose the subject invention for the reasons stated in Group B above nor does the inclusion of *Besharat* add anything new to the rejection of independent claim 6 from which claim 8 depends.

Group E

Claim 9 was rejected under 35 U.S.C. 103(a) as being unpatentable over *Coverdale*, U.S. Patent No. 5,809,414 and *Shah*, U.S. Patent No. 6,167,259 in view of *Detlef*, U.S. Patent No. 6,243,568 and further in view of *Besharat*, U.S. Patent No. 6,219,540 as applied to claim 8 above and further in view of *Obayashi*, U.S. Patent No. 5,802,039.

Appellant respectfully asserts that *Coverdale* and *Shah* in view of *Detlef* do not disclose the subject invention for the reasons stated in Group B above nor does the inclusion of *Besharat* or *Obayashi* add anything new to the rejection of independent claim 6 from which claim 9 ultimately depends.

CONSLUSION

None of the cited references, taken alone or in combination, show or suggest all of the features of the invention claimed in Groups A-E. Therefore, the rejections under 35 U.S.C. 103(a) are improper. The Appellant respectfully requests that the Board of Appeals reverse the decision of the Examiner in which all of the pending claims of the application were rejected.

Respectfully submitted,

Dated: April, 2004

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CLAIMS ON APPEAL

1. (Previously Amended) The method of indicating the quality of a received signal at a mobile phone, the received signal sent to the mobile phone by a remote transmitter, said method comprising the steps of:

detecting reception of the received a signal from the remote transmitter at the mobile phone,

inspecting said received signal by comparing said received signal with a predetermined threshold for determining its quality, at least in terms of a percentage of acceptable,

providing an output correlated to the results of said inspecting step such that when said received signal has met said predetermined threshold with which said received signal is compared during said operation of comparing, the output is of a first type and, otherwise, the output is of a second type, the second type different than the first type, and the output indicative of the quality of the received signal in terms of the percentage of acceptable, and

providing a user discernible indication in response to said output provided during said operation of providing the output, the user discernible indication indicative of the quality of the received signal in terms of the percentage of acceptable.

3. (Original) The method in accordance with claim 2 for use in conjunction with a digital transmission and receiving system wherein said inspecting step includes the step of determining the BER of said received signal over a sampling period.

4. (Original) The method in accordance with claim 3 which includes the step of ensuring that said received signal has failed to meet said threshold value for a predetermined time-out period before generating the said output indicative of such a failure.

5. (Previously Amended) The method in accordance with claim 1 wherein said providing the user discernible indication step includes the step of establishing a visual indicator for said user discernible indication.

6. (Previously Amended) The method of indicating the quality of a received signal at a mobile phone, the received signal sent to the mobile phone by a remote transmitter, said method comprising the steps of

detecting reception of the received signal from the remote transmitter at the mobile phone,

separating control signals from voice signals,

inspecting said received voice signal for determining its quality is at least either above or below a predetermined threshold by comparing said received voice signal with the predetermined threshold, the predetermined threshold forming a boundary condition, and the voice signal, when of a quality less than the predetermined threshold, indicated in terms of a percentage of acceptable and, when of a quality more than the predetermined threshold also indicated in terms of a percentage of acceptable,

providing an output correlated to the results of said inspecting step, and

providing a user discernible indication in response to said output that indicates the quality of the received voice signal in terms of the percentage of acceptable.

7. (Previously Amended) The method in accordance with claim 6 wherein said inspecting step includes the step of quantifying the amount, in terms of the percentage of acceptable, by which said voice signal fails to meet said predetermined threshold, and

said user discernible indication step includes the step of correlating the amount of said user discernible indication to the result of said quantifying step.

8. (Original) The method in accordance with claim 6 wherein said user discernible providing step includes the step of causing a visible display to pulsate.

9. (Previously Amended) The method of claim 8 wherein the amount of said display pulsation is correlated to the amount, in terms of the percentage of acceptable, said received voice signal departs from said predetermined threshold level.

10. (Original) The method in accordance with claim 6 wherein said user discernible providing step includes the step of causing a user discernible audio signal indicating the voice signal quality.

11. (Previously Amended) The method in accordance with claim 10 which includes the step of correlating the magnitude of said voice signal to the amount of departure of said voice signal from said predetermined threshold.

12. (Original) The method in accordance with claim 6 which includes the step of ensuring that the results of said inspecting step have remained over a preselected time-out period before generating the said user discernible indication.

13. (Previously Amended) Apparatus for indicating the quality of a received signal at a mobile phone, said apparatus comprising:

a signal receiving antenna on the mobile phone for receiving signals transmitted from a remote location,

a signal quality determining arrangement in said mobile phone coupled for inspecting said received signal in terms of a percentage of acceptable, said signal quality determining arrangement having a comparator for comparing said received signal with a predetermined threshold, said comparator for generating a first output signal whenever said received signal has met said threshold and for otherwise generating a second output different from said first output, the second output indicative of the quality of the received signal in terms of the percentage of the acceptable , and

a user discernible indication generator operable in response to said output signal, said user discernable indication generator for generating an indication indicative of the quality of the received signal in terms of the percentage of acceptable.

15. (Previously Amended) The apparatus in accordance with claim 14 for use in conjunction with a digital transmission and receiving system which includes a BER measuring device operable during a selected sampling period.